# The Gas Salesman
## and
# Gas Service.

VOL. 5, NO. 60.]

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## APPOINTMENTS & PROMOTIONS.

**Gas Salesmen, Showroom Attendants, and Manufacturers' Representatives are invited to send information as to promotion or changes in appointment for publication under this heading.**

## NOTICES.


***"The GAS SALESMAN" is published eighteen times a year; and the following are the Prices :***

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# EDITORIAL.

## The Hold-Up.

THE outrage upon the country by the General Council of the Trades Union Congress in calling a general strike in support of the coal miners' claim that they should contribute nothing—even temporarily—towards bringing about better economic conditions in the coal industry, has been condemned by the great majority of the community. The action of the Council was illegal, unconstitutional, and unpatriotic, and was a vain effort to demonstrate a superior power to democratic Government. It stopped not only coal supply, but the ordinary means of transport and production in various industries (indirectly also in other industries), including public intelligence through the newspapers—among them "THE GAS SALESMAN" for May 5, containing with other interesting matter, the report of the proceedings at the Industrial Salesman's Conference in Glasgow. We believe the calling of the strike has done more to embitter the nation against the new militant and autocratic trade unionism (which has been introduced by the extremists) than anything else could have done. We should not be surprised if it does not do much to bring about a revolt among the intelligent and patriotic members of the trade unions against those leaders who utilize collective power to undermine such industrial stability as we at present possess, and so make employment worse not only now, but for long to come. It is no part of the work of trade unions—whatever may be the policy of some of the leaders—deliberately to create misery and destroy employment.

Two imposing features of the strike have been the cheerfulness of the whole nation before the catastrophe, and the unanimity with which all who were not under the domination of the General Council of the Trade Union Congress co-operated for mitigating the effects of a despotic and criminal act against the community. In this connection, it should not be forgotten by those who were on strike that it was the men who supported the Government in repelling this dastardly attack who kept the strikers and their families from starvation; and the gas industry supplied them with the means for cooking their food.

The gas industry has, among others, suffered materially from the strike; and it is well that gas salesmen should be made acquainted with the fact, as they are bound to be a matter of general conversation. In the first place, the provision of abnormal stocks of gas-making materials means heavier expense upon a gas undertaking than would have been normally incurred, owing to the labour involved in putting coal into stock and taking it out again, instead of utilizing coal (apart from ordinary stock) as delivered. Then secondary products have had to accumulate owing to the absence of the necessary transport, except those which have been disposed of locally. No doubt coke sales have been good in some districts, although in residential areas there has been less need of solid fuel than would have been the case during the winter months. But it has been impossible to send products about the country by rail—for instance, tar to the distillers, and sulphate of ammonia to the farmers. This also applies to shipments, other than in the case of those undertakings situated at or near seaports. In most districts, too, the general strike has caused a heavy falling-off in the industrial and trade demands for gas. There will have been small compensation for this in the extra demand this time of the year for household purposes—seeing that economy was urged and ordered officially, and right-thinking people naturally inclined to make the supply last as long as possible, not knowing anything as to the duration of the strike. During such times gas undertakings do not, as a rule, seek for new consumption, and the abnormal environment created by the strike did not induce people to engage in purchases of new appliances which could be deferred to a more convenient season. But notwithstanding this break in, or slowing-down of, our normal activities, there will be prompt acceleration with the end of the trouble.

Though the strike inflicted great injury upon the country, it has provided several valuable lessons—among them the adaptability of the community in such a menacing emergency. The nation showed itself to be—as we knew it would be—more powerful than the General Council of the Trade

Union Congress; and, in truth, we believe their action did not commend itself to a large number of trade unionists, albeit following the instructions of the dictators. The strike has been a wonderful revelation of the power possessed by the country in the private ownership of mechanically-propelled vehicles, to which there was immediate recourse, and which alleviated enormously the absence of the ordinary services. Then, again, technical education has provided us with an enormous body of skilled men outside the Trade Unions; and this has been of tremendous advantage during the strike. Many students and assistants in engineering and electrical works have shown great capacity for working the railway services; and probably no unions engaged in this conflict with the community were more amazed than those associated with the railway services of the country by the quick release from the chaos that it was hoped to produce, which release eased the public roads of the enormous traffic at first thrown upon them. Old men also came from the retirement and rest which they had earned to do the work to which they were accustomed in days gone by; and their service the community recognize with gratitude. Voluntary work was offered at such a rate that employment could not be found for all who were willing to serve in the great emergency. We admire this patriotism. What was done must prove to the General Council of the Trade Union Congress that the power which they felt was resident in the aggregate membership of their Unions is not as it would have been in the days of old before changes came about in the qualifications of men, and in the mutations which have occurred in the world of transport.

The Government stood firm throughout against the despotic action which was intended to demonstrate that the power of ruling was in the hands of the Trade Union Congress, and not in the hands of the Government elected by the people to manage the affairs of the State. We believe that out of this evil good will come, notwithstanding their callous disregard of the misery and loss the General Council of the Trade Union Congress inflicted upon the country, as well as the additional unemployment they have created. Men who will do such acts are not fit leaders of men, with which view we know many trade unionists with the experience before them, thoroughly agree. The nation has come through it all with flying colours; the General Council of the Trade Union Congress with disgrace, and the reproach of the men and women of the country upon them. One word more. Many gas engineers have in the columns of the "GAS JOURNAL" testified to the great loyalty of their staffs and men. The gas industry has kept its flag flying, and will, we believe, continue to do so as long as the coal strike can continue.

## "Salesman" Publication.

IN accordance with the arrangement made last year, "THE GAS SALESMAN" is being published once a month during the summer; and in October we shall revert to the fortnightly issues, so as to keep the reports of meetings in close circulation. We believe the "double event" each month during last winter was very much appreciated. There is one thing we should like, and that is to enlist the services of gas salesmen in adding to the attractions of their own journal. They must often be engaged in installation work, to the publication of descriptions and photographs of which their managers would willingly give their consent. We should welcome such contributions, as well as other useful information concerning salesmen's work, or items of personal character—such as changes in appointments, promotions, &c. We hope this intimation will have good effect. Our electrical contemporaries are constantly publishing information concerning electrical sales and installation work such as that to which we have referred.

# Jottings.

The drip tin of a gas cooker is an accessory much appreciated by users of gas cooking stoves. In western countries, however, it does not evoke the ardent enthusiasm shown for it by the Formosan natives, as is explained by Mr. G. L. Jennings in this issue of the "SALESMAN." His recollections on this subject provide a further example of how familiarity breeds indifference, and indirectly they indicate how necessary it is to keep before the public, by means of good advertising, the virtues of gas.

* * *

In later columns of this issue of the "SALESMAN" we publish an abstract of a paper entitled "The Future of Gas in Industry," read by H. E. Broughton and H. C. Haroldson at a recent meeting of the Michigan Gas Association. In this they show that if gas is sold at 9d. a therm, and electricity at ¾d. a unit, the cost of heat units in the form of electricity will be greater than in the form of gas by 144 p.ct. Therefore a gas furnace only 40 p.ct. efficient can well compete with an electric furnace which is 100 p.ct. efficient, if ever such an appliance can be evolved. If in the future an efficiency of 25 p.ct. can be realized in the generation of electricity from coal, a gas plant with a thermal efficiency of from 65 to 85 p.ct. must still survive.

* * *

Speaking at Morecambe on April 24, on the occasion of a meeting of the Lancashire District (Manchester Section) Circle, Mr. T. W. Barratt, who is Engineer and Manager of the Morecambe Corporation Gas Department, said that there were many boarding-houses in Morecambe in which were fitted large double-oven kitchen ranges fired by coal. If these ranges could be substituted by coke boilers for hot water, three things would be accomplished. First they would do away with coal, and thus reduce the smoke nuisance; secondly they would encourage the installation of gas cookers; and thirdly they would be benefiting their consumers by fitting up for them an efficient cooking and hot water service which in the long run would prove less expensive than the present inconvenient and grossly inefficient methods. For a coke consumption of 1¼ cwt. of coke per week, said Mr. Barratt, a normal household could satisfy all their hot water requirements. It had been his experience that the larger coal ranges used on an average 3 to 4 cwt. of coal per week. The economy resulting from the use of coke was undoubtedly considerable.

* * *

A detailed paper on "Organization" was read by Mr. A. I. Seaton, of the Harrogate Gas Company, before the West Riding of Yorkshire Circle on April 21. The author says that perhaps the most important item in the organization of any business is the personnel to whom its conduct is entrusted. The most perfect system of organization would be in danger of breakdown if the heads and even the subordinates were unsuited to their tasks. Working on the policy that a butterfly catcher is not pre-eminently fitted to be a big-game hunter, the Harrogate Company endeavour to select from their staffs those most suited to the particular department by changing the duties of the juniors from time to time. This gives the Company a fairly good idea in what direction their abilities lie. As an instance of this, Mr. Seaton mentions that one of their salesmen, who was very successful, started with the Company as a meter inspector. From that position he became an assistant clerk in the stores, and thence found his way to the showroom and the district.

* * *

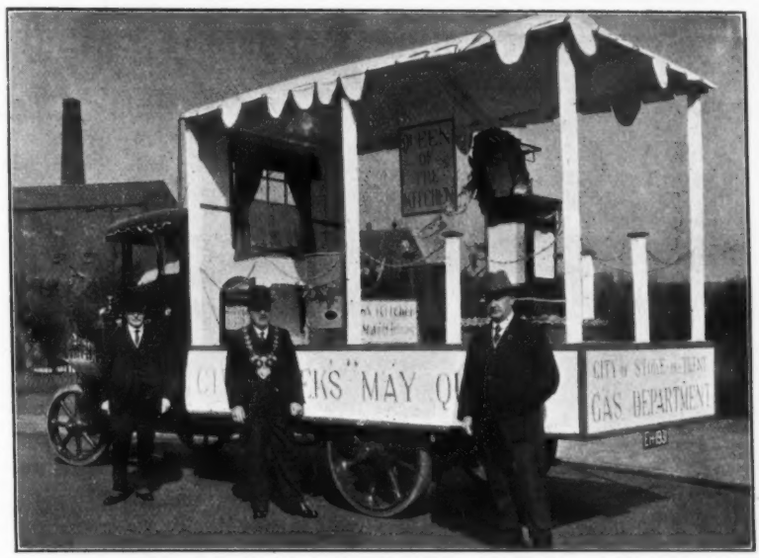
An interesting point in Mr. Seaton's paper is his belief in so placing the cash counter that, to pay an account, every customer must traverse the full length of the showroom, and thus be to some extent compelled to see what appliances the Company have for sale. The following is what the author says regarding this: "This is more important than one may be disposed to think, as we have many proofs that sales have been effected through a chance observance of something which takes a customer's fancy. In this way we get many people into our showroom who would otherwise never enter."

* * *

On the question of complaints relating to accounts, Mr. Seaton makes a very interesting observation. He draws attention to the weather conditions prevailing during comparative periods. During the quarter ended Dec. 31, 1925, for example, the conditions were far more severe than in the corresponding period of the previous year. In December, 1925, there were three days of fog, eight days of snowfall, and sixteen days of frost; while on no occasion in December, 1924, was there fog, snowfall, or frost. Whereas in the former month the average maximum temperature was 41° Fahr., the figure for the latter month was 50° Fahr. Mr. F. H. Robinson, the Engineer and Manager of the Harrogate Gas Company, has drawn-up a graph showing the effect of temperature on gas consumption; and this is of great value when dealing with complaints.

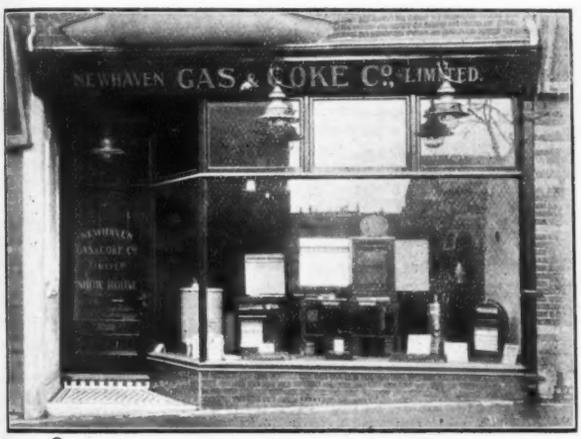
## Advertising Gas at Stoke-on-Trent.

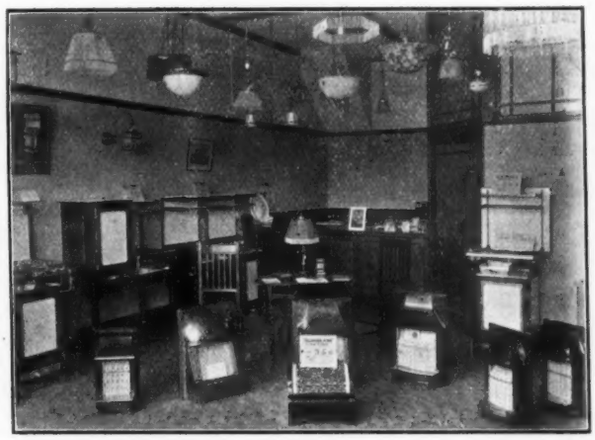
The accompanying illustration is of a demonstration lorry fitted-up by the Stoke-on-Trent Gas Department for exhibition during the Civic Week—May 3 to 8. Unfortunately the general strike caused a curtailment of the programmes, including the traders' pageant; but in spite of the difficult conditions which prevailed, the Gas Department's lorry covered 215 miles of streets during the week, and attracted considerable attention and favourable comment.




## New Showrooms at Newhaven.

We have received the accompanying photographs from Mr. A. A. Lucas, the Manager of the Newhaven Gas and Coke Company, Ltd. They illustrate the new showrooms which the Company opened in January last. It is interesting to learn that the premises were originally used as a fried fish shop, and that their conversion to their present attractive state was carried out, from the designs of Mr. Lucas, together with the decorations, by local firms. We congratulate the Company on their new possession, which enterprise, we are confident, will add considerably to the future expansion of business. The photographs are by Mr. J. J. Hill, photographer, of Newhaven.



**A Gas Rotisserie.**—A new pattern gas-heated rotisserie, for use in hotels, clubs, restaurants, &c., has been placed upon the market by the General Gas Light Company, of Kalamazoo (Mich.). It is on the lines of a modern gas fire, with a straight row of radiants. The meat to be roasted is rotated before the radiants in a 24-in. grill, which is automatically turned every 30 seconds; the turning being accomplished by a $\frac{1}{10}$-H.P. electric motor. The distance at which the meat is to be rotated before the radiants can be regulated. Over the rotisserie is a cast aluminium canopy top with a 5-in. vent opening; while in front and under the grill is a grey porcelain enamelled drip pan, which can be easily removed for cleaning. All moving parts are mounted on ball bearings, resulting in absolutely noiseless operation.

**Slot Meters and Hire Purchase.**—It is of interest to note that for some time past the Smethwick Gas Department have encouraged their prepayment consumers to purchase cookers and fires on hire-purchase terms. The meters are set in excess of the normal price of gas, and are emptied monthly. The balance over the sum required to pay for the gas consumed is handed to consumers, who then pay back to the collectors the amount of rent due for the appliances under purchase. This system, says Mr. Ernest Hardiker, the Engineer and Manager, in a letter published in the April 28 "GAS JOURNAL," has enabled consumers who would otherwise have found it inconvenient to pay by the usual quarterly method to purchase appliances, to the mutual benefit of consumers and Department alike. Mr. Hardiker considers that in an industrial town such as Smethwick, with an artisan population, this is an excellent method of promoting the sales of gas appliances.

**Importance of Good Business Letters.**—A good business letter, like a good advertisement, must, says "The Day's Work," of Cincinnati, do at least four things. It must secure attention, arouse interest by the manner of presentation, create desire by carrying conviction, and obtain action by using the proper persuasion after the facts have been logically presented. To gain these four essentials, a letter must be correct mechanically, from the designing of the letter-head itself to the set-up of the message. It must be clear, intelligible, and to the point, and inspire confidence by its tone. To be convincing, it must be written from the buyer's viewpoint, and should be free from exaggeration and over-enthusiasm; and it must have the right persuasive climax to induce the reader to act favourably. Letters are a vital link in your advertising chain. In analyzing your organization for weak points, and in working for the improvement of your sales and advertising units, remember that you will be well rewarded for any time and thought given to letters. In developing sales, and in establishing goodwill for your firm, letters add to, or subtract from, the ultimate results, according to what you put in or leave out of them.

**An Unusual Use for Gas.**—In New Jersey, lima beans, in their tender green state, form a much appreciated dish; and a big business is done in the canning of them. The process is explained by Mr. Jacob B. Jones (the Treasurer of the Bridgeton Gas Light Company), in an entertaining article in the pages of the "American Gas Journal." From this, it appears that the canner contracts with the farmer for so many acres of bush limas. When it comes time to take them to the factory, they do not stop to pick the beans by hand. A truck drives on the field, and the vine is pulled up by its roots and carried to the canning plant. Here they are made ready by machinery for packing; but the bean-shelling plant cannot separate the old white from the young green beans. This is where gas comes in. Plant operation considerations make it more economical to carry out the sorting by night; and after a trial of every known method of lighting, incandescent gas was finally selected as being the most suitable. Mr. Jones shows a photograph of a canning factory, where girls are sorting the beans for colour and size by the aid of 42 three-mantle gas lamps. The work goes on from 9 o'clock in the evening until 5 o'clock the next morning, thus giving an eight-hour lighting load when gas makers appreciate it.

# Some Experiences and Remarks.

(*Continued.*)

By G. L. JENNINGS.

When high-pressure gas was first applied to local distribution, it found out many weak spots in the system of jointing of mains usually practised. It is pleasing that the system of applying the pressure to the air, and leaving the gas under ordinary district pressure, is making such headway. Any who have had to deal with fractures of mains or leakages from mains where the gas in them is under a pressure of 2 lbs. per sq. in., or over, will appreciate this.

I recall a district in which turned and bored pipes had been laid to carry so-called high-pressure gas. These pipes had been laid in cold weather—that is, with contracted pipes—and had been, if anything, overdriven. The result was felt in hot weather, when there was a series of broken sockets, and many of the inhabitants became seriously alarmed owing to the escape of gas into their houses. Finally, this main had to be cut dead, and relaid.

Turned and bored pipes are very susceptible to alterations of temperature. A 10-in. main was laid down in one of the leading thoroughfares in a western suburb. It was laid in the summer, during a somewhat hot spell. When the winter set in, and the ground cooled, the main did not fracture, but many of the joints drew, and became leaky. Finally, a series of cut-outs had to be made, and lead joints inserted to take up the expansion and contraction.

The applying of pressure to gas brought several curious incidents in its train. I will only deal with a few. The first one I mention is interesting because it discloses a weakness in Gas Acts, under which gas companies might be liable to suffer bad effects.

A large consumer of coal gas had a 10-in. main connection to the Company's main, with three 500-light meters. These were adequate to deal with the normal consumption of gas on his premises. But his business grew, and considerably augmented supplies of gas were necessary. The local mains were already somewhat heavily taxed, and to supplement them would have been a costly matter. The roads through which the new mains would have had to be laid were wood paved over concrete, with no possibility of laying in the footpaths.

The consumer installed on his own premises, on the outlet of his meters, a pressure-raising plant, and maintained for his own use in his factory, by means of boosters and governors, a constant pressure of 10 in. Fortunately no bad effect was felt by the nearest consumers, or an unpleasant position might have been created.

I shall deal further with high-pressure gas in later articles, but the above case occurs to my mind as one which is worthy of consideration by gas companies in framing future Gas Acts.

The local representative of a gas company frequently has submitted to him complex problems of supplying gas to suit certain processes of manufacture. For instance, a large firm of film printers had installed a method of drying the newly-printed films by blowing air over electric filaments. The drawbacks were the possibility of a broken filament, with the accompanying danger of fire; expense; and the slow drying of the films. On the other hand, excessive temperature had to be avoided, otherwise the film would not dry flat, but would shrink and crinkle. The manufacturer was also of opinion that quick drying would produce brittleness of the film, which had to be avoided at any cost.

Here was a problem for gas. It was successfully overcome by installing an air heating plant. This was specially designed, and described in an article in the "GAS JOURNAL." A Blackman fan blew the air over heated wrought-iron tubes, and a fine gauze was inserted to catch any small particles of matter coming forward. The necessary variations in temperature, according to the prevailing weather and humidity of the atmosphere, were met by regulating the amount of gas consumed under the heating tubes. In practice this application was completely successful. The manufacturing costs were cut down to one-fifth of what they had previously been for this operation, the output of films was increased by about 50 p.ct., and the film produced was of a better quality than formerly.

A problem of a different nature was successfully solved. A maker of wireless apparatus required to heat and liquefy a bituminous compound used for insulating. He was using an ordinary gas-heated iron copper, and the drawback was the continual burning of the compound on the bottom of the pan, where the highest heat was applied. This burning involved continuous chipping-away of the burnt material, was expensive, and was accompanied by a loss of efficiency which was extremely annoying and costly. Furthermore, owing to this burning, it was not possible to draw-off through a tap, and the compound had to be taken out with a ladle. The state of the floor, with the accompanying risk of fire, can be imagined.

It was obviously a case for jacketing. Water, of course, was out of the question, owing to the temperature required being about 500° Fahr. I suggested and applied soft solder as the jacketing material. A double pan was used with the thinnest possible jacket of the solder. This proved successful, and all the previous drawbacks disappeared. There is no burning, the heating-up is quick, and the liquid can be drawn-off from a tap. The gas consumption, owing to the greater efficiency, has been reduced, and the output from the works greatly increased.

At the Franco-British Exhibition at Shepherd's Bush, the whole of the work in connection with the supply of gas was carried out by the Brentford Gas Company, under a guarantee of consumption. Here a double system of mains was laid—namely, high and low pressure services. It will be in the recollection of some of your readers that this was the first introduction of high-pressure gas lighting on a large scale; and an excellent advertisement it was.

A humorous incident at one of the White City exhibitions (the Japan-British) was in connection with the running of a supply of gas to the quarters of the Formosan natives. They were a savage set of men; and we were requested to make as little mess as possible in laying on the supply. The natives were lodged in a flat-roofed reinforced concrete building; and it was decided to run the necessary pipes on this roof. Where the hole was cut to allow the pipe to enter, we proposed to catch any material cut away, in the drip tin of a cooking stove. As soon as the fitter with this tin ascended the ladder, while his mate cut through the ceiling, the natives swarmed up the ladder and brought him hurriedly to the ground. The position had an ugly look until it became obvious that their intention was not to assault the fitter, but to obtain possession of the bright tin which he carried. As soon as they got this, the work was allowed to proceed without further molestation from them. However, to be pulled down a ladder by half-a-dozen naked savages is not a pleasant experience.

An interesting heating installation was the supplying of hot water to the Japanese wrestlers' bath. These men were engaged in giving exhibitions of Japanese wrestling; and very big men they were. They require a hot bath before and after each bout. A large concrete tank was made sufficiently big to hold about 24 men at a time. The depth of water was about 3 ft. 6 in. to 4 ft. In this they squatted so that the water came up to their necks.

The remarkable thing was the temperature of the water these men were able to stand. To an Englishman it would certainly have seemed excessively high. It was a curious sight to see a couple of dozen of these enormous fellows in a state of nature enjoying these baths.

My early recollection of the lighting of Olympia was by large "Coronas" fitted with flat flame burners and suspended in the middle of the building. They were at a great height. The pipes supplying them were near the main entrance to Olympia, and are still there. The meters were underground.

At a later date the main meters were moved to a convenient place, close to where the supply of gas enters the building. This was a much better arrangement. When the new Olympia Annexe was built, the authorities were so assured of the necessity for a proper gas supply that the Gas Company were asked to prepare a scheme for making gas available at any portion of the new building. A 12-in. main was laid to supply it; and the building is now one of the best, if not *the* best, fitted in London so far as gas supplies are concerned.

I have often been struck by the wonderful foresight of the early gas engineers, especially in regard to the size of pipes they laid down as trunk mains. When it is remembered that the Brentford Gas Company laid very few trunk mains (except inter-station communication) during the last quarter of a century, despite the fact that their sales of gas have quadrupled, it speaks volumes for the perspicacity and confidence of the engineers who controlled the Company in the 'seventies and 'eighties.

## Personal.

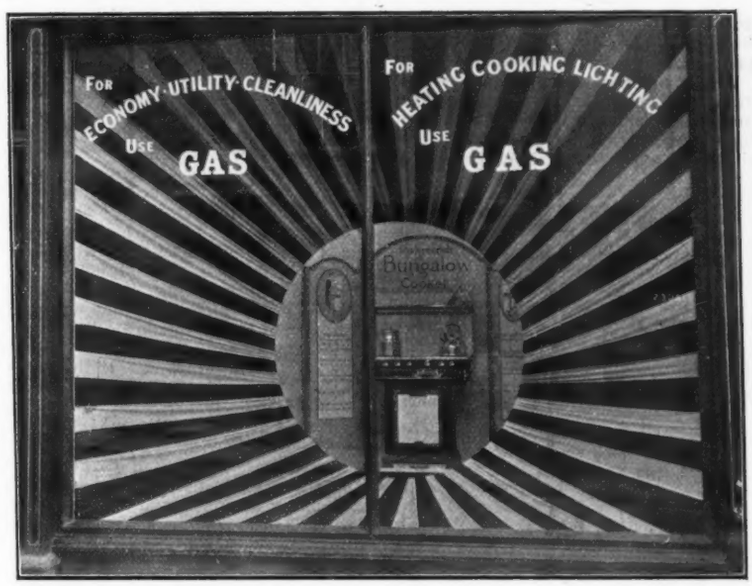
At the annual meeting of the Scottish Salesmen's Circle, Mr. J. GRAHAM, of Kilmarnock, was unanimously elected President of the Circle for the ensuing session.

According to the News Bulletin of the Pennsylvania Public Service Committee, the baking business in America spent no less than $5,250,000 on gas for heating in 1925.

In the Balham and Tooting Shopping Week News and Guide was an interesting article written by a consumer, and based on a visit to the Wandsworth Works of the Wandsworth, Wimbledon, and Epsom District Gas Company. In this it was mentioned that the Company make a special point of entering into small contracts for domestic requirements, whereby the consumer is certain of a fixed price for coke for six months. It is stated that, if the mains of the Company were placed end to end, they would reach from Wandsworth to the north of Edinburgh.

## Effective Window Display.

A photograph of an attractive window display comes from Basingstoke. The scheme was carried out in black and gold, and demonstrated that Richmond's "Bungalow" cooker has a place in the sun. The window was difficult to photograph, owing to shadow reflections; and this accounts for the fact that the "sun" appears slightly to the right of the window in our illustration. Actually, of course, it was in the centre.




# B.C.G.A. Gas Salesmen's Circles.

## Lancashire District—Manchester Section.

The Circle held a meeting at Morecambe on April 24, the proceedings taking place in the Council Chamber. The chair was occupied by Mr. J. H. SILLITOE (Chairman), supported by Mr. P. H. Christian (Vice-Chairman, Southport), Mr. S. Tagg (Engineer and Manager of the Preston Gas Company), Mr. W. M. Mason (General Manager of the B.C.G.A.), the Mayor of Morecambe (Alderman Gorton), Councillor J. C. Wilson (Chairman of the Gas Committee), and Mr. T. W. Barratt (Gas Engineer and Manager to the Morecambe Corporation).

The MAYOR extended a welcome to those present.

Mr. TAGG said he felt that no progressive councillors or body of men whose interest lay in public service could fail to support a gas undertaking, because, in the first place, by doing so they were ensuring the most profitable treatment of coal from a national point of view. There was no more economical method of treating raw coal than by its carbonization and the subsequent development and treatment of its products. In the provision of works adequate for the requirements of the district, and maintaining them in the most efficient condition, and in rendering it easy for consumers to obtain the necessary appliances, local authorities were doing work which was invaluable, and which helped the artizan class in a practical manner. Morecambe stood high in the category of authorities who supported and encouraged the recommendations of their technical advisers.

GREATEST NATIONAL FESTIVAL.

Mr. W. M. MASON delivered an address, remarking that in the course of his association with most of the Salesmen's Circles throughout the country, it had not been his privilege to attend one of the meetings of the Manchester Circle. Though not yet an old man, he felt he was speaking to a younger generation, and he advised them to profit by his own experience and draw inspiration from what they heard from men of more experience and knowledge in the same business. He had found it invaluable in his career. If a man in the gas industry or any other industry to-day based his work and output on how much he was going to get out of it, or what he was going to be paid, his work was not going to be worth very much. Success was not to be found in hoarding a lot of money or getting a big salary. It was a much bigger thing; it was in having the satisfaction that they did a job as it ought to be done. That being so, the profit or the salary would come incidentally. He gave several instances of young men who had risen superior to their environment through application and study of the technical side of the business. By giving real service, an individual or a concern would come into their own some day. They were engaged in important national work. The greatest national festival was not the cup final at Wembley or the Derby, but the Sunday dinner, when the highest peak in the gas industry was recorded. This showed in a plain statement the important position held by the gas industry in the life of the nation.

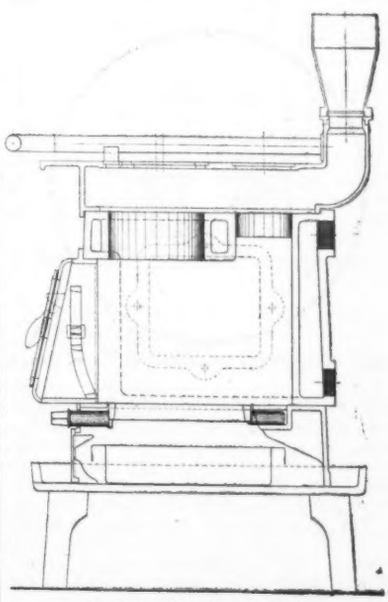
Mr. T. W. BARRATT said that if the salesmen's work was carried out on the lines indicated by Mr. Mason, then there was a bigger future for the gas industry than ever before.

### INDEPENDENT COKE BOILERS.

By Mr. WATSON, of Manchester.

The coal-fired kitchen range has a cast-iron or copper boiler at the back of the fire, and by means of dampers the flames can be directed beneath this boiler, whence they travel up the back of it, thereby heating the water. The hot water storage cylinder is usually fixed near the boiler, but may be placed in a linen cupboard, bathroom, or other convenient place, not necessarily above the level of the draw-off taps. The flow pipe from the boiler enters the cylinder a few inches from the top, and the return connection from the cylinder to the boiler is taken from the bottom of the cylinder, thus providing a continuous flow from the boiler to the cylinder. A pipe from the top of the cylinder terminates over the cold water supply cistern, or can be led out on to the roof. This is called the expansion pipe, and from this all branches and connections are taken.

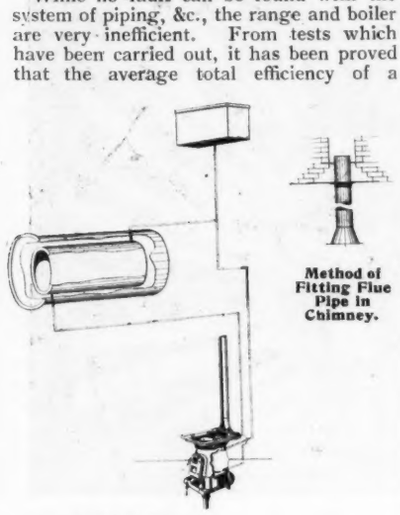
If a single pipe is laid to the various draw-points, which are some distance away from the cylinder, it means that the water lying in the pipes must first be drawn off before hot water is obtained. This is rather wasteful, as the water has to be replaced by cold water entering the cylinder. This, however, can be overcome by fitting a secondary return pipe, which should be carried to the cylinder about a third of the way down. By so doing, the water near the draw-off point is always in circulation. When a secondary circulation is taken from the cylinder, the primary connections—namely, the flow from the boiler—should be taken lower down the cylinder, to allow the secondary circulation to come above it. The cold



**Side Elevation of Coke Boiler.**

water feed pipe should always be taken to the cylinder, and not connected to the primary return, as is sometimes done.

While no fault can be found with the system of piping, &c., the range and boiler are very inefficient. From tests which have been carried out, it has been proved that the average total efficiency of a



Method of Fitting Flue Pipe in Chimney.

Indirect System.

kitchen range is only 15 p.ct., and of this 11 p.ct. represents heat transmitted to the water.

The most efficient means of obtaining hot water for domestic use is to instal an independent cast-iron boiler. The fire is practically surrounded by spaces containing water These spaces are relatively narrow, so that the circulation of the water inside the boiler is fairly rapid. Nevertheless, the space leaves plenty of room for cleaning the surfaces of the boiler when the large cleaning doors are removed, facilitating the removal of any deposit.

The firegrate is of sufficient area to ensure the rapid combustion of the fuel, should this be necessary at any time. Ample dampers are provided, both on the ashpit and on the flue, so that the rate of combustion can be kept under complete control. The firebars are arranged so that they can be rocked, for the easy removal of ash and cinders, and a box is fitted in the ashpit to catch these. Imagine the cleanliness of such an operation, and compare it with the conditions pertaining to the same operation in a kitchen range.

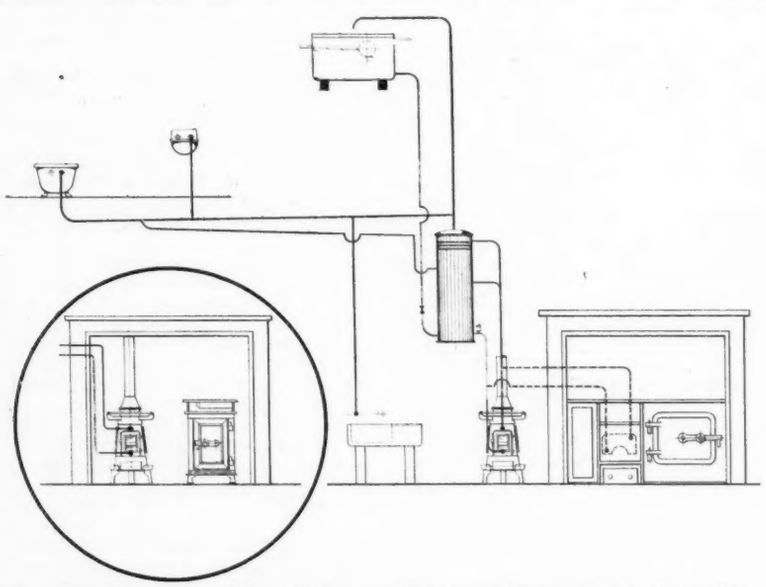
These boilers are small for the amount of work they do. There are many excellent makes on the market, varying in different details. Some are made purely for the heating of water, and serve no other purpose. Others have provision for a little simple cooking, iron heating, towel airing, &c., in addition.

Generally speaking, it is not advisable to instal radiators on a hot water supply system, the two should be kept separate, especially where there are several radiators. The disadvantage is that a larger boiler is required during the summer months than is necessary, and the temperature of the radiators is continually fluctuating, owing to hot water being drawn off. There is also the possibility of drawing-off discoloured water, unless, of course, all interior surfaces of the radiators, boiler, piping, &c., are specially treated.

Now in considering the application of a boiler to a house where the existing hot water supply is unsatisfactory, you will usually have the choice of two ways of doing the job: (*a*) The boiler can be fitted as an adjunct to the range, or (*b*) the range can be taken out altogether, and in its place a boiler and a gas cooker fitted.

Dealing with (*a*) first, this, from your point of view—and, really, also from the housewife's—is the less satisfactory of the two arrangements. But there still exists in certain quarters a strong feeling against the scrapping of a range; and in these cases you will have to make the best of things. In fitting, the flow from the new boiler is run into the flow from the range boiler, and similarly with the return pipes. If there is a disused flue near by, it is best to take the boiler flue into this. Otherwise it can be led into the same flue as the range.

In the case of (*b*), a much nicer arrangement can be obtained. It is best to have the range recess tiled, after the range is taken out. The flow and return pipes for the new boiler are coupled up to the old flow and return pipes, and the gas cooker is installed alongside the boiler.



Coke Boiler Fitted as Adjunct to a Coal Range. Inset is a Coke Boiler Gas Cooker Combination.

You will note that kitchen chimneys are usually enlarged over the range; and it is the best practice to extend the boiler flue pipe upwards until it enters the chimney proper, where it is usually 9 in. by 9 in. A suitable plate, provided with a hole to fit neatly round the smokepipe, is built into the brickwork, and rendered airtight. The top of the recess can be finished off in sheet steel or other similar material. If any bends are used in the smoke pipe, they should be obtuse ones, and cleaning doors should be fitted.

It may often be found, on fitting a boiler, that the existing flow and return pipes are too small, or badly incrusted; and it cannot be too strongly urged that these be made of adequate size while the change-over is being carried out. Though a good boiler will to a large extent overcome defects in circulation, insufficient heating surface, and other defects, in most cases, where defects in a system are known to exist, expenditure on a new boiler will be money wasted unless the defects are remedied.

The above method of directly connecting the heating boiler to the cylinder is known as the direct system, and for small installations is the cheapest. It is suitable for all districts where there is not likely to be any considerable deposit from the water. These deposits occur with hard water; the hardness implying the presence of salts of calcium, magnesium, and iron in solution. Hardness such as prevails in the South of England, which is a limestone strata, is the chief source of trouble in hot water supply. The continual heating of water of this nature would quickly cause the scaling-up of a boiler. Now this scale is a very bad conductor of heat, and the efficiency of the boiler would immediately fall off. Frequent cleaning would therefore be necessary, with consequent inconvenience. To overcome this difficulty, the indirect system of heating should be employed. In this case a storage cylinder is utilized having inside it another cylinder, radiators, or coils. These inner units are connected to the flow and return from the boiler, forming a small closed circuit. The flow from the boiler is led to the expansion tank, and off this pipe a connection is taken to the inner cylinder, radiator, or coil. The return from this cylinder is led back to the boiler. The remainder of the hot water pipes are as for the direct system. The hot water vent pipe is taken from the top of the cylinder, and connections from it are run to the various draw-off taps. The cold water supply from the cistern is led into the bottom of the cylinder.

With a hard water, the higher the temperature to which it is heated, the more deposit takes place. The water is subjected to the highest temperatures in the boiler; and normally the maximum deposit would take place there. But in the indirect system, with its closed circuit, only a small amount of salts is present in the water contained in the circuit; and after this quantity has been deposited, no further settling occurs. The cylinder is fitted with a cleaning door, and can be cleaned out periodically As the temperature is not likely to be excessive, the amount of deposit should not cause any trouble.

Pipes should be galvanized throughout. Easy fittings should, of course, be used. No sharp elbows should be employed at any time, as these readily collect deposit. Crosses with cleaning plugs are sometimes used. While these allow the pipes to be cleared, they form acute angles, and for this reason are not to be advocated.

If the water is soft, it is necessary to have the boiler Bower-Barffed, to prevent discoloration of the water.

To achieve good results, the flow and return pipes should be of ample size; and

| Gallons per Hour. | Private Houses. | Hotels. | Flats. | Offices. | Hospitals. | Schools. |
|---|---|---|---|---|---|---|
| Lavatory basins . . | 3 | 3 | 3 | 3 | 3 | 3 |
| Lavatory, public . . | — | 10 | — | 10 | — | 15 |
| Baths . . . . . | 40 | 40 | 40 | — | 40 | — |
| Showers . . . . . | 20 | 40 | 20 | — | 40 | 40 |
| Sinks . . . . . | 10 | 20 | 10 | — | 20 | 10 |

the nearer the storage cylinder is placed to the boiler, the better. It is strongly advised that all pipes and the cylinder should be lagged. As regards the size of the flow and return pipes from boiler to cylinder, the following are recommended :

| Cylinder Capacity | Pipe Sizes. Inches. |
|---|---|
| Up to 30 gallons | 1 |
| ,, ,, 60 ,, | 1¼ |
| ,, ,, 100 ,, | 1½ |
| ,, ,, 150 ,, | 2 |
| ,, ,, 200 ,, | 2½ |

Secondary flow and return pipes from the cylinder should have a rise and fall of not less than 1 in. in every 10 ft., and the vent pipe outlet should be the highest point in the system. The storage cylinders should be at least equal in water capacity to the maximum hourly demand. To estimate the quantity of water necessary, the table on p. 132 may be taken as good practice.

For an ordinary domestic job, the boiler power should be sufficient to impart a temperature rise to the cylinder contents of about 80° Fahr.—say, 40° to 120° Fahr.

A good boiler would be rated at about 11,000 B.Th.U. per hour per sq. ft. of heating surface. Some show better results, though the above performance can be taken as a fair figure. Generally speaking, the demand is not nearly so heavy as the above. Assuming the above figures, and a boiler having 3·2 sq. ft. of heating surface, we get 11,000 × 3·2 = 35,200 B.Th.U. per hour as the capacity of this boiler.

On the basis of coke with a calorific value of 12,500 B.Th.U. per lb., and taking 64 p.ct. efficiency in burning it, we get $\frac{35,200}{8000}$ = 4·4 lbs. of coke per hour. However, as the return pipe to the boiler will be, under average conditions, delivering water at about 80° Fahr. to the boiler, the rate of combustion will not be nearly as heavy as the above. Actually the above size of boiler should be operated on 1¼ cwt. to 1½ cwt. of coke per week. As to the fuel to be used, gas coke is the best available. Here you have a fuel practically free from volatile matter, and consequently almost smokeless. This being so, there is no trouble with soot being deposited on the heating surfaces, which deposition results in inefficiency. A coating of soot on the heating surfaces of a boiler has a similar insulating effect to a coating of scale inside, and means a considerable loss of conduction. Intense radiant heat is the significant feature of coke firing, and radiation is by far the most effective form of heat transmission.

It is agreed that the higher the volatile contents of a fuel, the more that fuel is liable to smoke, or its contents to escape from the furnace either in a partially burnt or unburnt condition. Conversely, the lower the percentage of volatile matter, the greater the simplicity and efficiency of combustion. Carbon is the most valuable heating constituent of any fuel. The calorific value of carbon is 14,500 B.Th.U. per lb. Ordinary gas coke contains 80 to 90 p.ct. of fixed carbon.

One advantage of these small boilers that I have not so far dwelt on is that they make good incinerators for the household refuse. They will burn all that is combustible. There are a good number of boilers on the market embodying various features. In choosing the one most suited for your customer, you should bear in mind that it will be in the hands of unskilled people, so that a multiplicity of gadgets is not to be commended. The control of the draught should be effective. The removal of ashes as clean a process as possible, and ample cleaning doors should be insisted on for the removal of deposit in the water passages.

Generally speaking, an abundant supply of hot water makes for contentment in the home. The boilers I have been describing will give this, and they have the added advantage of offering a new field for the sale of gas coke.

### Discussion.

Mr. MASON congratulated Mr. Watson upon refraining from boosting the apparatus he was representing. If the manufacturers' side would follow this excellent lead, there would be absolutely no cause for complaint. Plenty of engineers and gas salesmen as such were not very keen about the coke boiler, because they thought it was against the gas side; but it was important to remember that if they got a coke boiler in the house, it meant the elimination of the coal grate, and that meant a smokeless house or an all-gas house. If one ton of coke per year could be sold to each gas consumer in the various districts, instead of there being a coke glut, they would probably not have enough coke to go round.

Mr. BARRATT, in the course of the discussion, said there were one or two aspects of the case which had not been mentioned; and a few points of general interest might appeal to them as salesmen. It was possible some of those present represented undertakings burdened with heavy capital charges. They all appreciated the value and economy of gas circulators, but the price at which some of them had to sell their commodity gas did not make their use an economical proposition to the consumer. Here was an outlet which would help the management very considerably by getting rid of a bye-product, coke nuts. There were many boarding-houses, especially in Morecambe, where big double-oven kitchen coal ranges were in existence, which were heavy in coal consumption, and which, in some cases, were getting worn out. If these ranges could be substituted by coke boilers for hot water, they would, by doing away with coal, avoid the smoke nuisance. To get hot water at all, whether in summer or in winter, they were bound to keep the extravagant coal ranges in operation; and this being so, the majority made use of their coal ovens for cooking, whereas they would in nine cases out of ten otherwise adopt gas for that purpose. The coke boilers were benefiting the consumer because for 1¼ cwt. of coke per week, a household could be given all the hot water required. It had been his experience that the larger coal ranges used on an average about 3 to 4 cwt. of coal per week. This economy was, of course, of material advantage to the householder, and in a short time would pay for the cost of installation. An added advantage of the coke boiler, as pointed out by Mr. Watson, was that all household rubbish could be burnt in it. In the Corporation building scheme in Morecambe they had decided on this type of boiler. Another thing well worth notice was that where coke boilers were introduced there was from the architects' and builders' point of view a considerable saving effected in brickwork, because a small flue was all that was required with a coke boiler, whereas with a coal range a more or less massive chimney breast and chimney were required. It should be borne in mind that these boilers could also be fixed in conjunction with a coal range if necessary. There was a point in regard to the design of the boilers. In a seaside resort such as Morecambe, a great number of people had, during the season, to live in their kitchens; and the design of the coke boiler should be treated in the same manner as the design of the gas cooker approved of in recent years. People who lived in their kitchens wanted something pleasing, something attractive to look at, something which would be an ornament in the same way as the modern gas cooker was. The design, of course, should be such that it in no way affected the efficiency of the boiler. In concluding, Mr. Barratt emphasized the fact that the delegates present were the men upon whom the engineers had to rely, and it was important that they should have at their finger-tips knowledge of all apparatus, whether for burning gas, coke, or any other product.

Mr. CHRISTIAN (Southport) moved a vote of thanks to Mr. Watson, and mentioned their appreciation of the remarks of Mr. Barratt and Mr. Mason.

Mr. STEWART seconded; and the motion was heartily passed.

The proceedings then closed.

The members were entertained at tea by the Gas Committee of the Morecambe Corporation, the chair being occupied by Councillor Wilson.

# West Riding of Yorkshire Circle.

A Meeting of the Circle was held on March 21, in the Y.M.C.A., Victoria Avenue, Harrogate—Mr. C. WATSON (York) presiding. The engineers of the Calverley and Horsforth and Ripon Gas Companies were present.

Mr. F. H. ROBINSON, the Engineer and Manager of the Harrogate Gas Company, welcomed the visitors.

The CHAIRMAN then introduced Mr. A. I. Seaton, A.C.I.S., the Secretary of the Harrogate Gas Company, and in asking him to read his paper said that the Circle were extremely fortunate in being able to have a man of Mr. Seaton's ability and experience to address them.

### ORGANIZATION.

By ARTHUR I. SEATON, of Harrogate.

At the outset I should like to acknowledge that, in the organization of our system, I have had the privilege of examining those in operation at several well-known gas companies' offices—among which I may mention Newcastle-upon-Tyne, South Shields, York, and Scarborough—and that I have incorporated some of the information which I have obtained in this manner.

Perhaps the most important item in the organization of any business is the personnel to whom its conduct is entrusted. The most perfect system of organization would be in danger of a breakdown if the heads and even the subordinates in a department were unsuited to their tasks. For instance, a perfect salesman may be wasted in a counting house, and likewise an excellent accountant may be of little or no value in a showroom.

We endeavour to select from our staffs those most suited to the particular departments by changing the duties of our juniors from time to time. This gives us a fairly good idea in what direction their abilities lie, and how they will be most useful to the Company. As an instance of this, I may mention that one of our salesmen, who was very successful, started with us as a meter inspector. From that position he was drafted as an assistant stores clerk, and later to the showroom and to canvassing.

This changing of duties is also of great benefit to the junior members of the staff, as by this means they obtain an all-round knowledge of the organization, and are not simply wedded for an indefinite period to one stool in the office. We make it a rule that at least two of the staff shall be efficient at each duty. Each assistant in the various departments has his or her daily routine duty to perform, and any special or additional work is allocated by the chief of the department. They are thus enabled to proceed immediately on arrival, and there is no waiting for instructions.

In preparing your organization, it is essential that there be provision for recording all information that may be

wanted, and that such may be turned-up on occasion without undue loss of time. Care should, however, be taken that the making and preparing of such records should involve no unnecessary labour. I have seen some undertakings where it might be said that system had gone mad. The smallest piece of information was recorded, but the system was so complicated that it was difficult to know where to look for it. The methods adopted should as far as possible provide an internal check on all cash transactions and on all goods inward and outward.

As regards the system of accounting, I think all gas companies of any size have adopted the statutory form of accounts; and in arranging the system it is necessary to have firmly fixed on one's mind the information it is necessary to supply. The Harrogate Gas Company's office is divided into two departments—viz., the distribution or sales and showroom, under the Engineer and Manager, and the accountancy and clerical department, under the Secretary. While these departments are under separate control, they are dovetailed into each other in such a manner that they work smoothly together, and there is no overlapping.

The cash counter is in the showroom and situated so that every customer who comes to pay an account must walk the full length of the showroom, and thus be to some extent compelled to see what apparatus we have for sale. This is more important than one may be disposed to think, as we have very many proofs that sales have been effected through a chance observance of something which takes a customer's fancy. In this way we get many people into our showroom who would otherwise never enter.

Every customer who comes for purposes other than payment of an account, or inquiry in respect of such, is referred to the sales staff; and this gives them an opportunity of placing their wares before a possible buyer.

When a new customer comes to make application for gas, he is required to sign the usual form and is given a copy of the regulations under which the supply is afforded, and a printed statement as to the price of gas and scale of discounts. The salesman here has his opportunity to introduce his selling abilities. The present price is 9d. per therm *less* 10 p.ct. discount, equal to 3s. 1½d. net.

The application requires the address at which the gas supply is desired, the apparatus it is proposed to use, and the last address of the customer. If the salesman forms the opinion that the applicant is safe for credit, he passes the application, after booking the necessary orders, to the secretarial department. If he is not favourably impressed, he asks for a financial reference, or security. The secretarial department make inquiries from the gas undertaking in the town at which the customer was last supplied, as to the amount and manner in which accounts had been met. If care and tact are exercised in granting credit to unknown people, much anxious time is saved to those responsible for procuring payment of accounts, and the losses by bad debts are relatively small. During the years 1921 to 1925 ours have only averaged £68 18s. 8d. per annum, 0·009d. per therm, or 0·04d. per 1000 c.ft.

### SLOT SYSTEM.

If credit is not desirable, and security cannot be furnished, we endeavour to get our customers to take their supply of gas by prepayment meter. On this system, if the house is piped and a service fixed, we loan a cooker or griller and five fittings; the charge for hire being made along with that for gas. If the house has no service, and is not piped, we run the necessary piping, and supply a griller and three fittings. If a cooker is required, we fix this in place of the griller, and make a fixed charge of 5s.

We supply 18 c.ft. of gas per 1d., and make rebates varying from 16 to 25 p.ct., according to the apparatus on hire. This brings the charge on the two systems to parity.

The practice of making rebates in preference to changing price wheels has much to recommend it. In the first place, changing wheels is a very expensive operation, and secondly the rebate is an excellent method of obtaining settlement of small accounts. It is necessary to give credit for small amounts sometimes, and no rebate is returned if any such is owing.

### RECEIPT OF ORDERS.

I will now describe the method of dealing with orders received. Any inquiries made which do not result in an immediate order are carefully noted and filed for following-up or future reference. Orders received are booked by the salesman who receives them, and these are numbered consecutively, and indexed on a card system. We have thus a continuous record of orders received, and are able to trace in a few moments all orders given by any individual customer during a considerable period.

An order sheet is made out giving the same particulars, and is in all respects a copy of the order book, with columns for name of the fitter to whom the job is given, and the date the work is done. This order sheet is given to the workshop foreman who allocates the work. At the same time a job sheet is handed to the foreman. This contains all necessary information as to the work required, and the foreman hands it to the workman when he is instructed to go to the job.

The workman presents his job sheet to the stores clerk, who supplies and books any material necessary. These job sheets are returned each day by the workmen with particulars of the labour involved and the material used, and marked whether the work is completed or not. The foreman initials this if he is satisfied that the time, &c., are reasonable, and the stores clerk compares for materials, and initials for them. The job sheets are summarized each day by the workman on to his time sheet. The job sheets are handed to the sales department for pricing, and then passed to the accounts' office. Time sheets go to the wages clerk.

I will return later to the methods of dealing with wages and charging for work and material.

### STORES STOCK.

Correct and methodical keeping of stock records is very important, and almost always repays the time spent upon it. It is very difficult to keep track of leakages, and without a good system of stock-keeping is almost impossible. I do not wish to claim too much for our system, because it has not been fully used in some departments for sufficiently long a period; but in the stores for which it has been tested it has proved a reliable guide to the stocks held, and at times when stock has been taken it has proved very accurate.

For goods which are numbered, we use a stock card; the heading showing the article and the maximum and minimum stock which should be held. On the left are columns showing date received into stock, where from, order number, cost each, and total value of stock. On the right are six columns—one for each day of the week—indicating the number taken from stock each day. The total of these columns gives a week's output, and there is a final column for the total value of the articles taken out of stock each week. At the end of the week, those given out are deducted from the stock at the beginning, and the card ruled-off. A similar card is used for pipes and other material valued by weight, with the headings of the columns lettered to suit; the same method of stock-keeping being used.

If this stock system is kept up to date, it is very efficient, but unless this is done, it is a waste of time and stationery.

### METERS.

All meters purchased are debited to a "meter stores account." Each has a number given to it, and "a meter record card" is prepared, giving particulars as to stock number, makers' number and size, cost value, date received into stock, date taken out of stock, and where fixed, date repaired, and cost of repairing. We thus keep a history of each meter on one card. These cards are filed numerically, or as nearly so as possible, as we find it convenient to keep the cards for meters in stock in a separate compartment in the cabinet.

When a meter is fixed, it is entered into what we describe as a meter day-book, which gives full particulars as to when and where fixed, size, make, numbers, &c. The same information is also given for removals, and in the same book.

Each day these fixings and removals are entered on to the customers' meter cards and the meter record cards. From the day book particulars of all meters fixed are copied into the meters fixed book, which contains details of date and place of fixing, number and make, cost value of meter, material and labour. The "meters removed" book contains the same information as to removals, so that we get the value of fixing and removals for any given period from the totals of these books. These totals are worked into the books of account only once a year, but could easily be done more frequently—say, each quarter—if considered desirable.

A meters repairs book is also kept, in which is worked up the cost of all repairs; and from there the total cost of repairing each meter is transferred to the meter record card.

### GAS STOVES.

For gas stoves, whether cookers or heaters, we keep a loose-leaf stock book. On the left of each sheet are particulars of stoves inward, and on the right of stoves outward. We thus have a record of all stoves in stock, and a comparison can be made at any desired time, and is made at frequent intervals. The particulars on the inward side are date received into stock, description, value, and separate columns for new purchases, and returns from hire or hire-purchase. The outward side gives particulars of how disposed of, whether sold, hired, or placed on hire-purchase.

All stoves placed on simple hire are entered into the "gas stoves on hire" book, and given registered numbers. These are dealt with in exactly the same manner as that described for meters, a card with the same details being provided for each stove. In addition, particulars of stove as to description, registered number, and quarterly rental are placed on the consumer's meter card. "Stoves removals books," with all particulars, are also kept.

Repairs of gas stoves are charged in a separate book kept for that purpose; the particulars being date, number, material used, labour, and total. The total of these repairs is entered into the books of account once each quarter. The cost of repairing each individual stove is extracted from this book, and placed on to the stove record card. The apparatus on quarterly hire and prepayment hire are separately recorded, but the method in each case is the same.

### HIRE-PURCHASE.

The cost of fixing stoves on hire-purchase is a direct charge to the customer, and so does not require any special record. All apparatus placed on hire-purchase are entered into a "hire-purchase" book, the particulars of which are: Number, date,

where fixed, cost value, hire-purchase sale price, quarterly rental, and quarterly capital repayment. The difference between cost value and hire-purchase sale price represents the amount realized as profit on the sale of the stove, *plus* interest received for deferred payment. The hire-purchase agreement is for complete payment by twelve equal instalments extending over three years. Each quarterly payment, therefore, includes one-twelfth of the cost value, and one-twelfth of the profit on the completed transaction.

We deal with the former as a repayment of the principal, and with the second as profit to revenue account. An agreement is signed by the hirer specifying the terms and reserving the ownership of the apparatus in the Company until the final payment is made.

The hire-purchase system presents no complications, and is very popular with our customers. Since 1918 we have sold by hire purchase 1176 pieces of apparatus of a cost value of about £5000. This averages over that period 168 stoves, &c., per annum; but during 1923, 1924, and 1925, the respective figures were 212, 249, and 266.

The profit on these transactions has amounted to £1734 17s. 10d., being in—

| | £ | s. | d. |
|---|---|---|---|
| 1919 | 8 | 11 | 11 |
| 1920 | 65 | 13 | 9 |
| 1921 | 176 | 17 | 4 |
| 1922 | 305 | 18 | 5 |
| 1923 | 377 | 17 | 0 |
| 1924 | 410 | 12 | 4 |
| 1925 | 389 | 7 | 1 |

I think these figures speak for themselves, and indicate how popular hire-purchase has become.

A stove sold is far preferable to one on simple hire, as it practically assures the use of gas for cooking and heating. We add 20 p.ct. to the retail price for hire-purchase.

### METER AND FIXING COSTS.

After being priced by the sales department, the job sheets are passed on to the clerk responsible for recording the cost of fixing and removing meters, who makes the necessary charges opposite the entry in the "meters fixed" book or the "meters removed book," as the case may be. The process is then repeated for "stoves fixed on hire" or removed, "repairing mains and services," "repairing meters," "repairing stoves," and so on; any charges of a special nature being dealt with by a responsible clerk in the department.

### MAINS COSTS.

When laying mains, the foreman in charge gives a weekly report of all materials used, labour, length and size of pipes, and where laid. The labour should agree with the wages dissection sheet, and the material with the record from stock, and is thus checked on all jobs.

The sheet is in the following form:

| Where Laid. | Labour for Work as per Time Booked. | New Main. | Renewals. | Length and Size of Main Laid or Taken Out, and Material. |
|---|---|---|---|---|

These forms are summarized into the "mains fixed" book, and are brought into the books of account once each year.

Here I return to the method of dealing with the time-sheet. When the wages clerk receives this from the foreman, he allocates all labour of whatever description to an account whether chargeable to a customer or to some nominal account.

These accounts are all numbered and grouped under manufacture, management, distribution, sundries, and capital.

No. 1 is chargeable labour.

No. 2 is labour on fitting trade not chargeable.

No. 3 is incandescent maintenance, and so on; it is, I think, unnecessary to enumerate them all.

The dissection sheet is provided with a column for the man's name, rate of pay, columns Nos. 1 to 23 for the various accounts, and a total.

Six lines are used for each workman, so that a full week's labour can be allocated on one sheet; and the totals are copied on to the wages sheet proper at the end of each week. The totals of the various columns, with the exception of No. 1, should agree each week with the labour charged to the various accounts, and thus become a check on the clerical accuracy. The allocation of wages for each department—*i.e.*, manufacture, distribution, clerical, and official, are then summarized into a final "wages allocation" book.

### INVOICING WORK DONE AND GOODS SUPPLIED.

The job sheets are next handed to the invoice clerk, who types the particulars of the charges straight on to the invoice, which is in duplicate. The job number is always shown on the invoice, to facilitate any further reference. As each job is invoiced, the accounts are filed alphabetically, so that any future charges which may occur during the same month may be added. At the end of each month the accounts are totalled, and ready for dispatch to the customer; any that may be for uncompleted jobs being retained.

A list of the accounts is then prepared from the duplicates, showing name, address, and amount. The duplicate accounts are filed in the same order as they are listed, and marked as entered on List No. . . . This list becomes a loose leaf day book, and the debits are posted therefrom into the ledgers. There is thus only one ledger posting per month, which may quite probably cover five or six debits. There is a very great saving of time in not having to make debit entries by hand into the day books, and then re-copy on to the customer's account.

This system was introduced some six years ago, and has worked very well indeed. Much unnecessary writing was eliminated; and we are now able to handle a far greater amount of work with no more staff, and more promptly than formerly. The number of invoices rendered during the year 1925 for apparatus supplied and work done totalled 8880, equal to 30 per working day; our turnover in the sales department being £14,776. This has been accomplished by one typist, who, in addition, does a large amount of correspondence and other work.

### COKE.

Our system of charging coke and other residuals is very much on the lines adopted for invoicing fittings sales and work. The usual weigh ticket is issued at the gas-works, showing the weight and price and amount charged for coke and cartage. Each day a report—being a summary of the weigh tickets—is made by the coke clerk at the gas-works of all coke sold, giving the name and address of the customer to whom the coke is supplied, and the weight, rate of charge, cartage, and the total debit. This daily list is totalled for weight of coke supplied, charges for coke and for cartage, and grand total, and summarized at the end of each month.

The coke invoice clerk copies from the report straight on to the customer's account, which is in duplicate, similar to the fittings accounts. At the end of the month all accounts are totalled, and dispatched immediately; the duplicates being listed ready for posting into the coke ledger. The total charges for the month should agree with the summary of the works daily reports, and thus check the accuracy of the charges.

Other residuals—such as tar, liquor, &c.—are dealt with in the same manner.

### FITTINGS AND RESIDUALS LEDGERS.

Separate loose leaf ledgers, set out alphabetically, are in use for fittings and sundries, and for coke and residuals. These are arranged for districts "A," "B," and "C," for convenience.

*Fittings Ledger.*—This is ruled for:

DR.

| Name and Address. | Remarks. | Date. | D.B. fo. | Fittings. | Other debits. | Total. |
|---|---|---|---|---|---|---|

CR.

| Date of payment. | Folio or receipt No. | Cash or other credit. | Amount outstanding. |
|---|---|---|---|

*Coke Ledger.*—This is ruled exactly the same; but the fifth column is headed "Coke" and the sixth "Residuals." Owing to the method of invoicing our charges and introducing the ledger debits, usually only one line a month is required for each customer. Our accounts being rendered early each month, and a liberal discount being offered as an inducement to pay, we are able to obtain a settlement of many of our charges before the end of the quarter. The ledger clerks know fairly well from experience those customers who are likely to require more than one line in a quarter, and in such cases leave a line or two for this contingency. Of course, there are customers who have special accounts; and arrangements are made for these to have a full page or more.

Any cash in payment of these debits during the quarter is posted to these accounts direct from the receipt book duplicates, and amounts outstanding are transferred to a column provided in the gas ledgers. This system of introducing other debits into the gas ledgers is, I know, one which does not commend itself to some secretaries; but I have given both methods a fair trial, and prefer to do this. It has the advantage that, when a customer comes to pay his account without bringing the statement, reference to only one ledger account is necessary, and there is only one amount of cash paid to post. This saves a large amount of time at busy periods of the quarter. With the old method of having the accounts in separate ledgers, we were never able to keep our ledgers posted up to date during discount periods. Later you will see how it facilitates the entering-up of the cash books.

All our ledgers are self-balancing, which enables a check to be made each month on the clerical accuracy.

### METER CARD.

The customer's meter card is ruled to last about six or eight years without re-writing, and provision is made for three changes of customer and three changes of meter in that period. Information is contained as to the name and address, parish, and district "A," "B," or "C."

Space is provided for meters (see next page). I think this card fairly well explains itself; and all charges to be made direct into the gas ledger can be made from it.

In transferring the gas consumptions to the ledger, the greatest care should be exercised in comparing consumptions with corresponding periods of previous years, and thus detecting stopped or faulty meters.

### GAS LEDGERS.

Our gas ledgers are also on the loose-leaf principle, and are arranged into districts "A," "B," and "C" to correspond with the divisions in the fittings

*Meters.*

| Reg. No. | Size. | Make. | Maker's No. | Date Made. | Date Fixed. | Date Removed. |
|---|---|---|---|---|---|---|

Three Lines.

*Gas Stoves.*

| Reg. No. | Description. | Rent per Quarter. | Date Fixed. | Date Removed. |
|---|---|---|---|---|

Four Lines.

The purpose for which the meter is used—*i.e.*, lighting, cooking, or power.
Comparative consumptions for eight quarters prior to the particular card coming into use.

| | March. | June. | Sept. | Dec. |
|---|---|---|---|---|
| Consumption 1924 . . . | | | | |
| 1925 . . . | | | | |

And about fifty lines for index readings and consumption.

and residuals ledgers. These divisions are sub-divided into parishes for assessment purposes. Three sheets are required—viz., a debit sheet and a credit sheet, between which is the name and address sheet.

The ledger is ruled as follows:

DR. SHEET.

| Account No. | Index for this Quarter. | Index for Last. | Consn. in C.Ft. | Therms. | Rental at .... per Th. | Meter Rent. | Stove Rent. | Coke or Residuals. | Fittings. | Other Charges. | Arrears. | Total. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

One side for each quarter.

CR. SHEET.

| Account No. | Total Debit. | Date Paid. | Discount. | Amount Paid. | Receipt No. or Folio. | Other Credits. | Arrears Forward. |
|---|---|---|---|---|---|---|---|

Twice on one side.

NAME SHEET.

Heading, District or Parish .....

Name of Street .....

| No. of Account. | Consumer. | No. or Name of House. | Goods on Hire. | | |
|---|---|---|---|---|---|
| | | | Rental. s. d. | Description. | Reg. No. |

Eight spaces.

The debit entries for gas, and rent of meter and stoves, are entered from the consumers' meter cards, and the residuals and fittings amounts unpaid are transferred from the respective fittings and residuals ledgers.

The credit side of the gas ledger is, of course, simple. The discounts and amounts paid are posted direct from the receipt books. The other credits column is for allowances for overcharge or returns. The overcharges for gas or rental of meters or stoves are posted direct from the "gas ledger credits" book, which is ruled as follows:

| Customer's Name. | Address. | Description of Credit. | Gas. | Meter Rent. | Total. |
|---|---|---|---|---|---|
| | | | | | |

Credits for returns are made through the "fittings returns" book, which is a simple day-book in which returns are entered if they have been invoiced.

The totals of each page of the gas ledger are summarized in the "gas ledger summary," which is ruled exactly the same as the ledgers themselves. This summary gives each quarter the total gas accounted for, amounts owing for gas, meter and stove rents, &c. These ledgers have been in use for two years without rewriting; and it is expected that they will last ten or twelve years more.

The clerks responsible for receiving cash are not permitted to make any ledger entries, and the clerk who makes the debit in any ledger is not allowed to post any cash payment into that ledger. The clerk who makes debits into A posts cash into B

" " B " " C
" " C " " A,

so that a complete check is provided.

## CASH.

Three receipt books are always in use. One for each district "A," "B," and "C."

The receipts are four on each page, and the counterfoil is ruled in columns, for gas, fittings, and residuals. At the end of each day the columns are totalled, and the amounts entered into the corresponding column in the cash book, in this manner:

| Date. | Name or Rec. No. | A. | B. | C. | Total Gas. | Residuals. | Fittings, &c. | Total Sundries. | Grand. |
|---|---|---|---|---|---|---|---|---|---|
| | | £ s. d. | £ s. d. | £ s. d. | £ s. d. | s. d. | s. d. | s. d. | £ s. d. |
| | 3001/25 | 25 10 1 | | | 25 10 1 | 16 6 | | 16 6 | 26 6 7 |
| | 3101/20 | | 19 10 1 | | 19 10 1 | | 14 7 | 14 7 | 20 4 8 |
| | 3201/40 | | | 16 10 8 | 16 10 8 | 4 6 | 5 11 | 10 5 | 17 1 1 |
| | Jones. | | | | | | 3 6 | | 3 6 |

| | Gas | Sundries. |
|---|---|---|
| | £ s. d. | £ s. d. |
| 3001/3021 | 25 10 1 | 16 7 8 |

The amounts received are posted direct to the customer's account in the ledger, and the counterfoil marked as posted.

The "cash receipts" book is ruled as shown at bottom of previous columns.

With this method the receipt books can be totalled during the day, and cash can be entered and balanced in a very short time. It rarely takes more than half-an-hour on the busiest of days.

The tabular form of cash book assists materially at balancing periods, as it is known exactly what amount of cash has been posted to each particular ledger.

Every day the cash postings into the gas ledgers are checked with the cash book; a Burroughs adding machine being used for this work.

## COLLECTION OF ACCOUNTS.

The collection of accounts is more or less a worry to every company secretary; and a good system will help very materially in obtaining prompt settlement, and in keeping down collection costs.

In our Acts of Parliament it is provided that the charges for gas shall be subject to a discount of 10 p.ct. provided settlement is made within fourteen days from the delivery of the account.

This discount is so liberal that it is in itself a strong inducement to pay within the specified period, but it is a surprising fact that nearly 10 p.ct. of the customers fail to take advantage of the full discount. When the period for allowing full discount has elapsed, a further fourteen days is allowed in which to take advantage of the half discount. Immediately the full discount period has expired, we send a reminder to all who have not paid. This reminder reads as follows:

Dear Sir or Madam,

As your 1st of ..... gas account appears not to have been paid, and may have been overlooked, permit me to remind you that one-half of the discount named upon the account will be allowed if payment is made on or before the ..... inst.

I am,
Yours respectfully,
Secretary.

After the expiration of the second period of fourteen days, we send either an "A" or "B" notice.

"A" NOTICE.

As your 1st of ..... gas account is in arrear, I am instructed by the Directors to ask for the favour of settlement on or before ..... the ..... inst.

Yours respectfully,
Secretary.

"B" NOTICE.

As your 1st of ..... gas account is in arrear, I am instructed by the Directors to ask for the favour of settlement on or before the ....., and I have also to intimate that if this request is not complied with the gas supply will be discontinued.

Yours respectfully,
Secretary.

Our experience of the customer is the deciding factor as to which notice is sent.

With "B" notice we usually give seven days for settlement; and if this does not result in our obtaining payment, a statutory 24 hours' notice to discontinue the supply is given, which reads as follows:

Dear

As your 1st of ..... gas account is still unpaid, I beg to give you formal notice that unless I am favoured with settlement by..... the gas supply will be discontinued and the meter and apparatus belonging to this Company removed without further notice.

I am also to inform you that proceedings will be taken immediately to enforce settlement of the account.

Yours faithfully,
Secretary.

With regard to the accounts for work done and goods supplied, we are under no obligation to allow discount; but our experience is that a discount of 5 p.ct. for monthly account is a great inducement to pay, and in my opinion does not cost so much as would the necessary collectors. This discount system, I am sure, is a very great saving of worry; and when I tell you that out of about 12,000 customers we did not find it necessary to summon more than half-a-dozen last year, I think you will agree with me.

Up to about ten years ago all our accounts became due for payment on one day, and this necessitated almost all our staff confining their attention to the receipt of money, much to the detriment of the book-keeping. It was then decided to divide the area into three districts, with three consecutive days as the final ones for the discount period. This improved matters very much, but still left the work very heavy on the clerks.

In 1921, when the Company went to Parliament for various powers, a clause was inserted in the Act giving authority to make the discount period expire fourteen days from delivery of account.

Generally, one clerk is able to cope with the work at discount times, but it is never necessary to put on more than three clerks at one period.

### The Filing System.

Our correspondence is filed on the "Roneo" system, which is alphabetical and is sub-divided to suit the convenience of the user. All correspondence with one person or firm is filed in his particular folder; and if the correspondence with that firm is large, it again may be sub-divided under the heading to which it refers. The system is so well known that I think it is unnecessary to enlarge upon it, more than to say that we have found it to work very efficiently.

### Complaints *re* Accounts.

Perhaps one of the most difficult matters to deal with, and one which requires the greatest amount of tact on the part of the assistant, is dealing with complaints respecting charges for gas, work done, or other matters. Every care should be taken before an account leaves the office that the possibility of error is reduced to a minimum. There is nothing more annoying to a customer than to receive a statement of account for an item already paid.

Our system of daily cash postings and checkings is designed to obviate, as far as possible, errors of that description; and all accounts before they go out are checked with the ledger. But however perfect your system may be, there are other circumstances to take into account—such as the human element, the possibility of a meter registering fast or slow, and abnormal conditions of gas consumption. These factors have all to be taken into account when considering whether the charge for gas is a correct one. Whenever customers feel they have cause for complaint, no trouble can be too great to find any possibility of error; and the utmost patience and tact are required on the part of the person who has to receive or deal with the complaint.

Generally the customer shows a great deal of annoyance when he receives a demand for something over and above what he considers the charge should be; and this attitude is, of course, not to be wondered at. I make a point never to express an opinion that the account is right until I have had it investigated, but always assume the possibility of an error until it is proved that there is none.

Having received the complaint, the first comparison that is made is with the customer's meter card, the gas ledgers, or other ledgers, as the case may be. Having satisfied myself that there is no clerical error, an inspector is sent to the premises at which the gas is consumed, if necessary with a test meter. He tests the pipes for leakage, investigates the condition of the apparatus, and tests the meter for accuracy of registration. If there are no conditions apparent for an increased consumption, careful inquiry should be made of the household; and I think it is a good rule always to make inquiries of a responsible person in the household, and to avoid if possible interrogating a domestic. I quite agree that there is sometimes a possibility of getting more facts from a domestic than from the householder; but it is almost certain that if inquiry is made from a servant it will only increase the annoyance already felt by the customer.

Another point which requires careful consideration is the atmospheric conditions prevailing as between comparative periods. Our Engineer got out a graph showing the effect of temperature on gas consumption. This was of very great use to me when dealing with complaints respecting increased gas consumption; and I think is well worth making out for a quarter in which the conditions are in any way abnormal. During the quarter ended Dec. 31, 1925, the weather conditions were far more severe than in the corresponding period of the previous year. For instance:

*Comparative Table of Weather Conditions.*

| | Fog. | Snowfall. | Frost. |
|---|---|---|---|
| 1925. | | | |
| November . | — | 3 days | 22 days |
| December . | 3 days | 8 ,, | 16 ,, |
| 1924. | | | |
| November . | *Nil* | *Nil* | 3 ,, |
| December . | *Nil* | *Nil* | *Nil* |

AVERAGE TEMPERATURE.

| | Maximum. | Minimum. |
|---|---|---|
| 1925. | | |
| November. . . . . | 43° | 31° |
| December. . . . . | 41° | 30° |
| 1924. | | |
| November. . . . . | 48° | 38° |
| December. . . . . | 50° | 40° |

The snowfall shown indicates the actual days upon which snow fell; but owing to the severe frost, there was very little time during November and December when snow was not on the ground.

Sometimes people will say that, as they have no gas heating apparatus, conditions of temperature cannot affect an account; but it must be remembered that during the periods of keen frost, water has to be heated through a greater number of degrees than in milder conditions, and I have had ample proof that increased gas consumption has been occasioned through this. Methods of using apparatus are also responsible for excessive consumptions. Our inspectors have seen, when visiting houses, that where the contents of a vessel were required to be kept simmering, instead of turning-down the gas, the pan has been half-drawn from the burner, leaving the gas on at full. Other times we have known a customer to take her food out of the gas oven and forget to turn the gas off. Heating irons on a gas hot-plate when a large fire is doing nothing constitutes waste.

Sometimes it is impossible for the inspector to indicate the cause of an increased account; and these are the most difficult cases on which to satisfy a customer. Whenever we are at such a loss, I arrange for regular inspections of the meter at very short intervals, keeping a close watch on the account, and keeping the customer informed of how his consumption is proceeding. This enables the customer to keep an eye on things himself, and always shows to him that we are really trying to assist him. The following is a letter which I recently received from a customer with whom I had adopted this plan:

March 17, 1926.

**Very many thanks indeed for your letter of the 16th instant, and for all the trouble you have so kindly taken in this matter. I cannot tell you how much I appreciate the kindly way in which you have dealt with my request.**

After the inspectors have made their inspections, it is best to confirm their report by letter. There are occasions when it is not necessary, but it is generally advisable to have a record of the result.

Complaints are entered into a "complaint" book as they are received. A complaint card is prepared, given to the inspector, and filed with his report.

### Slot Meter Collection.

Our slot meter collection is, I believe, on general lines. The meter record sheet contains the usual information as to the parish, district, name of customer and street, particulars of meter and apparatus on hire, provision for the date of inspection, index, consumption in c.ft., in therms, price at so much per therm, sundries, and total due, rebate allowed, net gas collection, sundries paid, any balance owing, and space for remarks. This enables an inspector while at the house to see that all is in order. All our inspectors are sent into one district at the same time, and a man with a light hand-cart accompanies them. As the load of coin becomes heavy, the inspectors deposit the money collected into compartments in the hand-cart. A receipt is given for each amount collected, the counterfoils of which are printed in columns, and five receipts are open to view. A running total of the day's receipts is made, and the final for the day with each inspector should represent the amount of cash he hands in. Next day these receipts are summarized into their various parishes, and the cash compared with the amount of gas shown as consumed. The meter sheet is thus the customer's ledger-account, the summary of the sheets becomes the gas ledger record, and the total of the daily summaries at the end of each quarter shows the gas consumed in each area during the quarter. This system is simple, easily worked, and accurate.

The system of sending a cart to relieve inspectors of their load has proved very beneficial, and some period during the day the cash is brought straight to the bank, and deposited. This saves a great deal of handling in the office. The total weight of copper and silver coin banked during the year 1925 was between 35 and 40 tons.

It is our policy, wherever possible, to fix 1s. slot meters in preference to 1d. meters; and we find that in the majority of cases this is also more acceptable to the customer.

In conclusion, may I be permitted to suggest that one of the fundamental principles of organization is that whatever job presents itself, it must be done at the proper time. Procrastination is no good, and to let any system run into arrear will most certainly impair its efficiency and probably destroy it altogether. Only by keeping all the separate parts of an organization working smoothly can the best be got out of it.

I trust that my paper has been of interest, and possibly of service.

If any member of your Association would like to have copies of any of the forms I have mentioned, I shall be happy to furnish them.

### Discussion.

Mr. F. H. Robinson, opening the discussion, said that organization in the office was all important. There was, however, the question of organization of labour, but this would require a separate paper; it could not be dealt with that day. He told how seven years ago, on his and Mr. Seaton's appointment to their present positions, a sort of genealogical tree was drawn up showing exactly how the respective managerial and secretarial duties began and ended. Thus they could see which, and exactly where, various duties were overlapping, and they carefully studied these points and built their system from such findings. Organization, continued Mr. Robinson, did not apply only to the work of the heads of departments, it referred to every employee; and no doubt the mere placing

of facts and figures in an orderly and understandable way on a sheet of foolscap was a piece of organization which might not be well accomplished by some, while by others it would be a simple matter. This was why he had said that organization applied to every member of the staff. As to the balancing of the Company's books, every credit was due to Mr. Seaton and his staff. Speaking on the question of hire-purchase, which had come to the fore after being allowed to lapse, Mr. Robinson advocated the furtherance of this system, and also of cash sales in preference to hire. Their turnover was £14,776 for sales, which he considered to be good for a 500-million works.

Mr. F. LODGE (Wakefield) asked how the accounts were sent out.

Mr. J. R. FIRTH (Bradford) was in agreement with Mr. Seaton in that an office could have too much system. He thought the booking of orders was rather complicated, and suggested that it would be an improvement if they adopted the system where the order was booked straight to job vouchers. In his opinion it would obviate a duplicity of forms, and would always provide a ready reference. He pointed out that this system was used in Bradford, and had been found highly satisfactory. He also suggested that much valuable time could be saved in stores by workmen, if all jobs were estimated and material prepared beforehand. What means had they at Harrogate for ascertaining workmen's unproductive time? Regarding stock records, he thought it would be an improvement if they kept a card for every article stocked, instead of having a separate book for some appliances. With reference to stock-taking, how often did they take stock, and what method did they adopt? He thought the system of making accounts direct from job sheets was excellent, but desired to know what happened to the latter. He asked what method was used for the transference of goods purchased stock price to the stock records.

Mr. ROBINSON, regarding checking fitters' time, said that each fitter's time-sheet and job-sheet were checked, and should tally. The sheets were ruled for both labour and material.

Mr. ADAMSON (York) asked if the foreman, in checking time, &c., on the sheets, went to the job. He thought that if it was not done on the job, the fitter could, if so disposed, make the job-sheet and the time-sheet tally. Mr. Adamson outlined the system in operation at York, showing the deviations from that put forward by Mr. Seaton, and pointing out that the sending of an inspector to estimate material required assured the requisite material only being sent, and a correct booking of same to the job-sheet. Mr. Adamson, referring to the making-out of accounts, said that the D.B. entry and account were made out simultaneously by means of the typewriter attachment for that purpose; the accounts being sent monthly to the collectors.

Mr. S. H. PACKER, referring to the scheme in operation at Bradford, said this was the "B.C.G.A." commercial organization scheme, which had been found very successful. He regretted that this scheme had not met with more favour throughout the country. If the various gas undertakings and companies were so well organized that they did not need this scheme, then it was well with the industry; but he did not think that such an optimistic view was justified. In order to meet an ever-increasing competition, the gas industry ought to pursue real economy in every direction; and the "B.C.G.A." scheme and the one outlined that afternoon were especially worth studying in this respect. Continuing, Mr. Packer said he thought Mr. Seaton had struck the right note at the commencement by referring to personnel. The system of changing the duties of juniors was to be commended. It was an opportunity of getting more youth into the showrooms; and this would be a big advantage, because no doubt in the past the showrooms had been a dumping ground of inefficients, and business had suffered in consequence. Mr. Packer said that the granting of credit was sometimes a delicate problem, especially if it so happened that the case in question was a master plumber or trader who was being attended to by a junior assistant. A word in the wrong place might result in the loss of a lot of sales. Municipal authorities were perhaps in a fortunate position in being able to refer such inquiries to the city treasurer, who could form a good idea regarding the person in question from his payment of rates and other accounts. This system worked very satisfactorily in Bradford. Regarding hire-purchase, Mr. Packer referred to the fact that it had been reported from America that hire-purchase schemes had "gone mad." He thought, however, that in England, so far as the gas industry was concerned, the more they could do to substitute hire-purchase for simple hire, the better it would be. Recently they had increased the period from three to five years; and he would like to ask Mr. Seaton what percentage he thought should be added to cover this increase. Regarding the keeping of stock, Mr. Packer said that the best possible organization was of vital importance in this respect, because not only was a true and complete record essential, but a well-kept stock record was very useful to help the buying department, and large stocks of goods which were slow sellers were not accumulated. To show the importance of this, he instanced that recently he had seen in a showroom at least forty highly-finished high-grade fires. He considered this far too many.

Mr. H. ROBINSON (Ossett) said that in disputed accounts he was not in agreement with consumers having weekly inspections paid, in order that the consumption might be watched.

Mr. J. W. CARLTON (Shipley) agreed with Mr. Seaton's idea of dealing with disputed accounts. This would initiate consumers into checking their own accounts regularly, and the gas undertakings were creating goodwill and confidence. He agreed with the payment of accounts in showrooms. It should be the policy to get as many people as possible into the showrooms. Regarding stores, Mr. Carlton asked Mr. Seaton how many were employed in the stores at Harrogate. He advocated the provision of a record card for each appliance. How many prepayment meters were emptied per day in Harrogate?

Mr. J. W. HORWILL (Bradford) remarked that in Bradford, on the gas accounts, in addition to stating the date of expiry of the discount period, there was a statement that, if the account was not paid by a certain further date, the supply would be discontinued. This saved the sending out of additional notices calling attention to the unpaid account. The keeping of records of weather conditions was an excellent idea, and one which would be worked in conjunction with the engineering side.

Mr. E. A. LEASK (Leeds) spoke on the advantage of up-to-date and efficient office machinery, and instanced the making of the day-book entries at the same time as the invoice was made out from the job-sheets. Mr. Leask was in favour of hire-purchase schemes in preference to hire.

Mr. E. WILLIAMSON (Leeds) said that issues from stores were entered on the job-sheets in black and returns in red.

The CHAIRMAN agreed that one could have too many high-grade fires in stock, especially as some finishes are apt to deteriorate by being continually handled. Regarding the granting of credit, he had had many experiences; and he thought that the salesman could generally form an opinion of the customer. As for hire-purchase, it was advisable at times to make the period suit the order in question.

### MR. SEATON'S REPLY.

Mr. SEATON, replying to Mr. Lodge, said that at Harrogate gas accounts were delivered by hand. Each bore a number corresponding to its entry in the gas ledger. Collectors were instructed to hand the accounts to some person, and then to record the number on the delivery record. If they were unable to do this, the account was returned to the office, and posted; the record being kept on "accounts by post" record card. Accounts were never put into letter boxes. Regarding Mr. Firth's observations, the system in use occupied very little time, and any copying necessary could be done by a junior clerk. The job-sheet was handed to the workman, and the job list was to enable the foreman to keep a record of where his men were engaged. It was always easier to turn up a job entered in a book, and numbered, than to turn up from filed papers. All the job-sheets were filed in numerical order. The workmen's time-sheets showed when they commenced and finished a job; and unproductive time was ascertained when allocating wages. Stock records were not kept on separate cards for large articles purely for sale. That necessitated a large number of cards with only one entry thereon. It was quite easy to record such apparatus in book form. Goods into stock were entered on to the cards from the invoice after it had been checked with goods received. The outdoor foreman visited men on the jobs at his discretion. The workmen never knew when to expect him. If desirable, the job was inspected and necessary material estimated before the workmen went to it; but to do this in many cases would be a waste of time. The system of invoicing at York was very similar to that at Harrogate; the difference being that at York every debit required to be posted separately in the customer's ledger account, while under the Harrogate system any number of debits in the same month could be posted in one item. This saved a large amount of ledger work. Replying to Mr. Packer, Mr. Seaton said they were on very good terms with the master plumbers, who in most cases brought their customers to the gas showrooms to purchase any necessary apparatus. They generally tried to arrange cash terms, and the plumber got a commission on the sale. Regarding hire-purchase, they had not found it necessary to consider any longer period than three years. For some classes of apparatus they made the period shorter. They would, of course, much prefer that a customer should retrench, in preference to continuing in a dissatisfied state. A satisfied customer was a good advertisement. The number of employees in the stores department was three (two men and one boy); and they worked-up wages sheets and allocation. Fifty slot meters were emptied per day; but Harrogate was an exceptional town, and could not be accepted as a guide to what should be done in a congested working-class area. Mr. Seaton, replying to Mr. Horwill, said he did not like the Bradford method. It might save sending a lot of notices, but he would not like to receive an account with such an intimation on the first rendering.

On the proposition of Mr. F. LODGE, seconded by Mr. J. W. HOLROYD (Elland), a vote of thanks was passed to Mr. Seaton, who suitably responded.

The members then adjourned to the Café Imperial, Parliament Street, for tea at the invitation of the Directors of the Harrogate Gas Company. Mr. ROBINSON presided.

Mr. LEASK proposed the best thanks of the Circle to the Directors and Management of the Harrogate Gas Company for the facilities and the hospitality granted. Mr. ADAMSON seconded, and Mr. ROBINSON and Mr. SEATON acknowledged the vote on behalf of the Company.

## Midlands Circle.

The Hon. Secretary (Mr. J. Tudor Rees) sends the following announcement:

NATION'S HEALTH EXHIBITION, LEICESTER.

This Exhibition, postponed on account of the general strike, will be opened from May 26 to June 5.

Mr. Hubert Pooley, Engineer and Manager of the Leicester Gas Department, has kindly repeated his invitation to members of the Circle to visit the Exhibition; the arranged new date being Saturday, May 29.

### BIRMINGHAM MEETING.

The next general meeting of the Circle will be held at the Chamber of Commerce, Birmingham, at 3 p.m. on Wednesday, June 2, when Mr. E. L. Oughton, Sales Superintendent of the South Suburban Gas Company, will read a paper on "Selling Gas for Light, Heat, and Power." It will be remembered that the paper was originally in the programme for the meeting on May 5, which was cancelled owing to the general strike. Mr. G. E. Burden has postponed his paper so that members may have an opportunity of hearing Mr. Oughton. It is hoped that the attendance at the meeting will be thoroughly representative of the Circle.

## Gas in Industry.

**How it Compares in Cost with Electricity.**

At a recent meeting of the Michigan Gas Association, H. E. Broughton and H. C. Haroldson read a paper entitled "The Future of Gas in Industry." This contained some highly interesting data concerning the relative costs of gas and electricity for furnace heating. The figures are given in American money, but these can readily be converted into shillings and pence. The price of gas is taken as $1 per 1000 c.ft., which agrees closely with current prices in this country. The price of electricity, 1½ c. per unit, is, however, lower than that prevailing here to-day, so that the comparison in England would be even more favourable to gas than what follows.

Both gas and electricity are easy to control, are cleanly in use, and are available instantly; and with these advantages it is to be expected that they will be used more and more in the future in preference to solid or liquid fuels, because labour costs, furnace maintenance, and storage expense can be reduced to a minimum.

The drawback to electricity, however, is its cost. Taking the rate for gas used industrially as one which cannot be considered low, and a rate for electricity which cannot be regarded as high, we get the following comparison: A gas of 550 B.Th.U. at $1 per 1000 c.ft. costs $1·80 per 1,000,000 B.Th.U.; electricity at 1½ c. per unit will cost $4·40 per 1,000,000 B.Th.U.—or about 144 p.ct. more. Therefore a gas furnace only 40 p.ct. efficient can well compete with an electric furnace which is 100 p.ct. efficient, if ever such an appliance can be evolved.

In modern plants electrical engineers talk of producing 1 KW.-H. per lb. of coal burnt. Even if an efficiency of 25 p.ct. can be realized in the electric plant, a gas plant with a thermal efficiency of from 65 to 85 p.ct. must still survive.

Approximately five tons of coal are consumed to yield the equivalent of one ton of coal in electric heat. In making gas, five tons of coal yield the equivalent of four tons of heat units. But the electrical men will say that the resulting heat units of electricity are net, for the flue losses and combustion losses have been incurred in the power-house; the gas units are gross, because the heat which escapes by the flue in the combustion gases performs no useful work, so that of the gas heat units equivalent to four tons of coal, less than one ton is available for useful work. The balance has gone to make up the combustion and flue losses. Statements of this kind by the electrical interests very largely account for the progress made in the employment of electrical heating in industry.

The authors point out, however, that this statement needs great qualification. At the relatively low temperatures such as are used for house heating, the loss of heat in flue gases is a far smaller proportion, whereas in the case of high-temperature combustion a large proportion of the heat in the gases of combustion is recoverable by employing heat recuperators. The accompanying table shows costs per 1,000,000 B.Th.U. of town gas and electricity at different temperatures of burning and at certain rates, as well as the effect of using heat recuperators.

| Fuel. | Temp. of Burning | Price per Unit. | Cost 1. | Cost 2. |
|---|---|---|---|---|
| | | | $ | $ |
| Town gas | 400° Fahr. | 75 c. per 1000 c.ft. | 0.158 | .. |
| Electricity | 400° Fahr. | 1½ c. per KW. | 0.456 | .. |
| Town gas | 1600° Fahr. | .. | 0.238 | 0.185 |
| Electricity | 1600° Fahr. | .. | 0.488 | .. |
| Town gas | 2300° Fahr. | .. | 0.364 | 0.240 |
| Electricity | 2300° Fahr. | .. | 0.518 | .. |

1. Without recuperator. 2. With recuperator.

The figures indicate that gas heating at the three temperatures given is considerably cheaper than electrical heating.

Obviously such a comparison can be regarded only in conjunction with the relative prices of the two heating agents.

## A Folding Stove.

Mr. J. F. Hardecker describes in the "American Gas Journal" a folding hotplate, which, with its four burners, is large enough to hold conveniently a small separate oven for baking purposes. When not required for use, the hotplate is dropped down, so that, when fitted against an existing wall, it extends from the wall only 7 in. When its installation is contemplated at the time of planning a new house it can, of course, be so arranged as to be flush with the wall when folded-down.

Beneath the burners there is a deep enamelled tray, which can be drawn-out for cleaning, and also serves as a receptacle for dishes. There is a hinged enamelled top which completely covers the stove when folded away, so preventing dust and dirt from collecting in the burners, and protecting the gas cocks in such a way that they cannot be accidentally turned on. While the stove is in use, the raised cover serves as an easily-cleaned splash guard; and, with the stove out of action but in position for operation, the lowered top provides a smooth table surface. An automatic valve, in axial alignment with the bearings of the hotplate, shuts-off the gas from the cocks when the stove is folded-down, thus removing all danger of an accidental escape.

It is felt that there is a field of usefulness for such a stove in flats and other space-restricted situations, as well as in nurseries, &c.

## Naphthalene in Horticulture.

The "News Bulletin" of the New England Bureau of Public Service Information publishes the following:

Recently a gas company has been making extensive experiments as to the possibilities of naphthalene in the control of insects and fungus pests in the growing of fruit, vegetables, and flowers. It is claimed that it will destroy or keep away from trees, shrubs, and gardens all kinds of destructive worms and insects which are now the plague of farmers and orchardists, and which cause an incalculable loss yearly to the country.

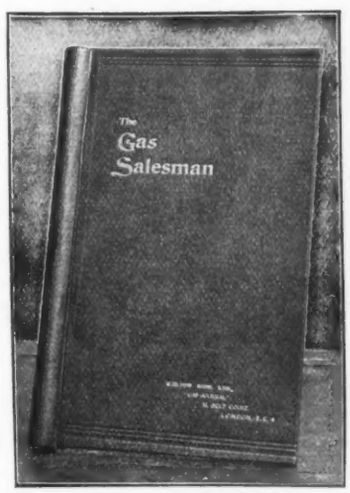
It is claimed that naphthalene is not in any way harmful to growing things, and that an application of approximately 200 lbs. to the acre, or about 4 lbs. to 100 sq. yds., thoroughly worked in, will keep the ground clear of insects and worms. Experiments are being made to test the effect on the strawberry weevil and onion fly, as well as the common aphis. Some success has also been had in ridding poultry of mites and lice by sprinkling naphthalene in dusting boxes. Considerable success has been claimed by growers of bulbs in ridding the ground of wireworms and other pests, including centipedes, cut worm, slugs, snails, &c.

## Goodwill Window Displays.

The two fundamental and primary uses to which the showroom windows of a public utility company can be put—*i.e.*, to sell goods and to build goodwill—are discussed by Mr. S. C. Rieser (of the Laclede Gas Light Company, St. Louis), Chairman of the American Gas Association Committee on Gas Display, in the Association's "Monthly."

The job of planning window displays that will develop goodwill, he says, depends on local conditions, and must be worked-out accordingly; but the uses to which goodwill displays can be put are universally about the same. The objectives are constant; it is merely the routes to the goal which vary. The objectives of goodwill window displays are many. In the first place, they should put a human aspect on the public service corporation. They can be used to show the public that the company is human after all; that it is a part of the community; that it depends on the community for its existence; and that it is therefore just as anxious to please as any other institution, from the smallest store up. Goodwill window displays can go far towards making the public utility a vital and esteemed part of the community.

There is one point of particular importance in this connection to which Mr. Rieser draws attention. It is that a company which is known for its fairness, and whose importance to the community is recognized, cannot be harassed easily. Goodwill is a great bulwark against this sort of thing. It renders adverse legislation more difficult of enactment. Further, by making the aims, the ideals, and the service of the company known to the general public, all effort towards the development of goodwill tends to stifle the suspicion and distrust which invariably exist in the mass mind as it views large and strange forces.

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## HOW TO DEMONSTRATE CONTROL OF GAS COOKING.

An interesting way to demonstrate to the Public how completely the "Regulo" controls the oven heat of the latest Radiation "JUNIOR" Cookers ("New World" patents) under all circumstances is as follows:—

Set the "Regulo" at any point and light up the oven burner. After the oven has become heated, as indicated by the fact that the flames have become small, just open the oven door. In under two minutes the flames, which will have been small when the door was opened, will be seen gradually to extend in length, compensating at once for the reduction in the temperature caused by the open door.

This is the most convincing way of showing that gas is now easily the most economical fuel for cooking.

Full particulars and illustrated booklet of any "JUNIOR" Gas Cookers sent on request as below.

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THE RICHMOND GAS STOVE & METER CO., Ltd., Warrington and London. ("*Bungalow Junior*").
WILSONS & MATHIESONS, Ltd., Leeds and London. ("*Wilson Junior*").
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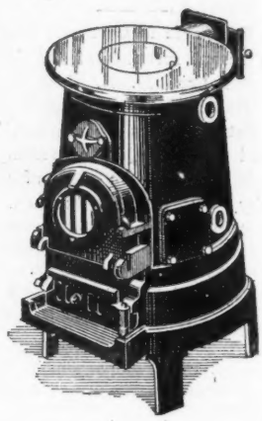

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### The SHAKING BOTTOM

Many Coke Boilers are not fitted with a shaking bottom. To clear the ash from the fire it is necessary, therefore, to use a poker, and a cloud of dust comes out into the room every time this is done.

If the ash is not removed, it will be turned into clinker the next time the draught is forced through the boiler to get hot water quickly.

With the "Glow-Worm" Boiler, all that is necessary to remove the dust and ashes from the fire, is to close the front door, and the ash pit door, and open the damper wide. The lever of the shaking bottom should then be pulled backwards and forwards until a red glow can be seen through the mica door.

The damper should then be put into the correct position, according to the work required to be done.

No dust will come out into the room while this is being done.

*Other patented and special features will appear in following advertisements. Gas Salesmen are requested to study the whole series and so learn all the selling points of the "Glow-Worm"*

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